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NEAR-SIGHTEDNESS A DISEASE, AND NOT MERELY AN
INFIRMITY.

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UNTIL a very recent date it has been a common belief, both among the profession and the public, that myopia, or short-sightedness, was scarcely worthy of attention. Its subjects could not, indeed, enjoy vision beyond a very limited range, except with the aid of glasses; but as they were supposed to require only such aid to place them on an equality with others, and were thought to have stronger vision for minute objects, they often deemed themselves, and were regarded by others, as fortunate in their infirmity.

It is very desirable that the attention of the profession should be called to the importance of this subject, as viewed in the new light thrown upon it by the ophthalmoscope, and that all cases of any considerable degree of myopia in adults and of inherited myopia in children should receive careful investigation, in order that they may be preserved, by timely prophylactic measures, from the serious consequences resulting from progressive pathological changes, which are almost certain to follow improper management of myopic eyes.

It is now well known that short sight is a consequence of an abnormal form of the globe, consisting in an elongation of its antero-posterior diameter. Its refractive power is thus in excess, and images of objects are formed in front of the retina. But this elongation does not equally affect all parts of the globe. It occurs principally in its posterior portion, and especially in the region surrounding the entrance of the optic nerve; where a bulging outwards of the sclerotica, termed posterior staphyloma, takes place. This is readily perceptible with the ophthalmoscope, and easily verified, when occasion offers, by *post-mortem* examination.

So long as the staphyloma is of trivial extent, it may scarcely or not at all interfere with excellent sight, and vision may be normal with the aid of glasses. But when it begins to deepen or

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extend, it becomes a source of the greatest dangers. Every increase in its amount thins and weakens yet more the sclerotica and choroid, and renders these tunics of the globe less able to resist further changes. The retina, distended over a larger surface, has its perceptive power diluted, and morbid alterations often manifest themselves in the macula lutea, the central point of vision. If the changes of the subjacent tissues continue to progress, the retina no longer accommodates itself to them, but becomes separated, and a serous infiltration interposes between it and the choroid. These pathological phenomena involve much loss of visual power, and sight is no longer perfect, with or without the aid of glasses. They are, however, but the earliest and least of a series of morbid changes. Unless great care is taken that the patient does not devote himself to unsuitable employments, further developments ensue as the person advances towards middle age; the nutrition of the transparent media becomes disturbed, cloudy flakes show themselves in the vitreous humor, and the crystalline lens begins to exhibit opacities which go on increasing till cataract is fully matured, of which the removal by operation would, in these instances, be futile for the restoration of sight.

Herein lies the danger: the earlier progress of the disease is so insidious that, if unwarned by the physician, the patient reaches a point where arrest of his downward course has become impossible, ere he perceives cause for alarm.

Two cases I have lately seen illustrate these points.

Mrs. —, slightly past middle life, had always been very myopic, but had, notwithstanding, allowed herself to do much fine work and carry on an extensive correspondence. At length she could no longer see well enough for these occupations, and had, even with the best glasses, only very imperfect vision at a distance. She complained of black spectra before the eyes, and of dull pain in the circum-orbital region. On ophthalmoscopic examination, large staphyloma, with alteration in the macula, was found in both eyes. Floating opacities existed in the vitreous, and radii of cloudiness were beginning to form in the crystalline lenses. Vision must evidently gradually diminish.

A clergyman, about 50 years of age, had been since his recollection very short-sighted. After studious preparation he began his professional life, and since, had not only written his sermons, but had done a large amount of other writing, bringing his head near his desk in order to see. Two years before I saw him, on suddenly finding himself nearly blind in one eye, he consulted an oculist of this city, who advised the substitution of other glasses for those he had previously worn. This gave him no relief, and the sight of the other eye gradually failed.

On looking with the ophthalmoscope, I found the retina, in the eye first affected, almost entirely separated from the choroid, and it

retained scarcely any perceptive power. The other eye exhibited large staphyloma, much opacity of the vitreous, and commencing cataract. The prognosis must now be very unfavorable; but had this gentleman been advised, early in life, to give up all thought of a profession requiring close application, and to devote himself to an active employment not requiring much use of the eyes for small objects, he might probably have enjoyed very good vision to his dying day.

The predisposing cause of these extreme pathological alterations is found in the elongation of the globe, which exists as an hereditary condition in most persons who are affected with myopia. But in many, probably in most cases, this abnormal shape of the globe and tendency to staphyloma is present in merely an incipient degree, and the predisposing influences may remain latent and harmless if the action of exciting causes does not supervene. If, now, the child is allowed to apply his eyes assiduously to study, writing, drawing, sewing, or other occupations requiring the head to be bent forward and the eyes continually accommodated for near objects, a higher and higher degree of myopia is perhaps rapidly developed, the muscular action associated with accommodation having an effect to compress and elongate yet more the posterior portion of the eyeball. The congestion of the vessels of the globe, caused by the inclined position of the head, increases the danger of further morbid changes.

Whenever, therefore, even slight symptoms of short-sightedness are manifested, and especially if myopia has been present in the family, on the side of either parent, the child should be examined at an early period with the ophthalmoscope, to ascertain if posterior staphyloma exists and what is its degree. This ophthalmoscopic inspection gives no pain or annoyance, and it is not necessary previously to dilate the pupil by atropia. Its importance cannot be too much insisted on; as progressive staphyloma is most liable to occur, and to lay the foundation for changes fatal to vision, between the ages of ten and twenty. Then, if ever, our interposition may avail to avert future blindness—a danger as yet little suspected by the patient or his friends.

If, on examination, we find only slight staphyloma, with a healthy condition of other parts of the retina, and with normal acuteness of vision, so that distant objects are distinctly seen with concave glasses of moderate power, we may permit even literary pursuits or professional studies, provided care is taken that the eyes shall be relieved by frequent intervals of rest, and the head kept, as much as possible, erect. But if, on the contrary, the normal acuteness of vision is diminished, if large staphyloma is already formed, or the retina or vitreous exhibit unhealthy conditions, it is unsafe to allow any employment requiring constant application of the eyes or a stooping posture. The individual should be advised to lay aside any preferences, and even to abandon occupations or trades which involve

danger, no matter at what sacrifice, that he may avert the threatened mischief. He should adopt such avocations as require only moderate use of the eyes, and avoid everything tending to produce cerebral congestion.

Another point on which it is important to insist, is, that glasses of suitable strength to give tolerably distinct vision should be habitually worn at all times when the eyes are not employed upon small objects. By so doing the eyes are spared the necessity of making strained efforts to recognize friends or things about them, which should be avoided on account of the muscular action they call into play, by which the pressure backward is increased and the posterior staphyloma enlarged.

RECENT RESEARCHES ON SCABIES.

THE final demonstration of the *Acarus scabiei*, by Renucci, in 1834, after two centuries at least of doubt about its existence, by no means decided the question as to the nature of scabies. There are, indeed, those who even now look on the animal as not the cause, but the effect of the disease. Dr. Frazer, of Dublin,* still maintains this view. The reasons he gives for this opinion are, however, for the most part, founded on error. He asserts that, in the Norwegian itch, the parasite is not the same as in the ordinary form of the disease; but, though this was at one time the opinion of Hebra, the more recent researches of Boeck have shown that it is not the case. Another of his arguments, that all persons are not equally susceptible of the contagion of scabies, is opposed to the latest views of Hebra, who thinks that the skin of every man offers sufficient accommodation to the acarus, if only full opportunity for contagion be afforded. A third statement of Dr. Frazer's, that "those who have passed through the unpleasant stages of an attack, and have been thoroughly cured, show a comparative, it might almost be said an absolute immunity from future infection," would no doubt, if true, support the view that something more than the acarus is concerned in the causation of the disease; but we are at present ignorant on what this assertion rests. Dr. Frazer himself insists on the "strange tendency which the disease shows to relapses, *when insufficiently treated*, and its indefinite duration when neglected."

There are others also whose views are similar. Devergie, one of the staff of the Hôpital St. Louis, the finest field in Europe for the observation of cutaneous affections, asserts that scabies may be a spontaneous disease, and that the presence of the acarus is only one of its subordinate characters; and Mr. Hunt, in a book which affords to Hebra most valuable opportunities of amusing his class, declares that "the real cause of scabies is dirt." But Devergie has

* Treatment of Diseases of the Skin, p. 66.

probably but few followers among the younger French dermatologists; and Mr. Hunt is not very likely to have many converts to his views in this country. We do not doubt that in a few years it will be universally admitted that scabies is propagated and produced solely by the parasite.

One of the questions which earliest suggested itself, when the existence of the acarus was proved, was whether the disease was transmissible from animals to man. A good deal of information upon this subject is given by Küchenmeister.* He admits that the acari of the cat and of the lion may be identical with that of man, which differs from them only in size. He states that Bourguignon observed the transference of the mite of the lion to the human subject, and *vice versa*. Hardy says that, the lion of a menagerie having scabies, the keepers became affected with various eruptions, but no treatment was necessary; and he thinks that the acari of other animals produce in man only a temporary prurigo. Hebra, on the other hand, says that he has frequently observed the transmission of scabies from animals to man in the menagerie at Schönbrunn; and he thinks that the *Sarcoptes equi*, *S. canis*, *S. suis*, *S. cati*, and *S. cuniculi* of Gerlach, as well as the *S. scabiei crustosæ*, *S. vulpis*, *S. capræ*, *S. squamiferus*, and *S. minor* of Fürstenberg, are all varieties of the same animal. The acarus of the horse is, however, very different from that of man. Eichstedt† says that on examining some of the crusts taken from a mangy horse, in which the mite peculiar to that animal could not be detected, he found in it several specimens of the acarus *scabiei* of man. This appears to show that the differences in the form of the parasite are not, as is supposed by Hebra, merely due to differences in its seat. Hebra himself states that he has found the ordinary acarus *scabiei* in the camel, the Egyptian sheep, and the ferret; and he says that Fürstenberg has discovered it also in the horse, the lion, the llama, an ape, and a Neapolitan sheep.

There is no better way of tracing the development of scabies, and no more conclusive proof of the real nature of the affection, than to place an impregnated female acarus upon the skin, and then to leave it to its own devices. The fact of impregnation, which is of course all-important, is readily determined in the way pointed out by Gudden. We have only to extract an acarus, without injuring it, from a recent cuniculus, and then to cut off the portion of skin containing the cuniculus, and to examine it under the microscope. If it should present ova, we may be quite sure that the animal will afterwards deposit others. Hebra says, however, that a female acarus, even though it may lay eggs, does not always with certainty generate scabies; and he recommends for the artificial production of the disease, the application to the skin of a whole cuniculus removed from another person suffering from that affection.

* Manual of Parasites (Translation of the Sydenham Society), vol. II., p. 50.

† Forster's Notizen, 39, 1846, p. 209.

For the experimental investigation of the habits of the acarus, however, it is best to take a single female, and place it upon the skin. It moves briskly over the surface, and soon begins to attack the epidermis. It may either proceed at once to bury itself, or it may leave off after a time, and commence again at another spot. In penetrating the superficial part of the epidermis, the acarus seems to experience some difficulty. It places itself in a position almost vertical with respect to the skin, supporting itself by means of the long bristles which project from the hinder part of its body. Having once pierced the surface of the cuticle, it makes more rapid progress, and in from ten to thirty minutes it is completely buried. It naturally attacks in preference those parts of the skin which have the thinnest epidermis, and for this reason it appears often to select the entrances of the hair-sacs.

Having thus ensconced itself within the epidermis, it continues to traverse the rete mucosum in a horizontal direction, and proceeds to lay its eggs. The number of ova which are deposited by one acarus is variously estimated. Hebra has never seen more than twenty-four to twenty-six ova in one cuniculus. Gudden, on the other hand, counted fifty-one in one passage, at the bottom of which was the parent, which still contained ova; and he assumes fifty to be the ordinary number. The rapidity with which they are laid varies with the age of the acarus. An experiment of Gudden's, made in the winter of 1859-60, gives very precise information upon this point. He placed an acarus, which was ascertained to have laid previously only three ova, and which contained another nearly ready to be deposited, upon the skin of a healthy person, who was kept all day in a moderately warm room. At the end of five days, the cuniculus was cut out, and was found to contain eleven eggs. In other observations, in which the acari were more nearly exhausted, the eggs were deposited much more slowly, one in two or three days. According to Bourguignon and Gudden, apertures are always found, at more or less regular distances, in the roof of the passages formed by the acari, and it is supposed that they may serve for air-holes. Their existence is positively denied by Hebra; but however this may be, it appears certain that they are not used by the female acarus as means of egress from the cuniculus. The animal, in fact, never emerges from the passage which it has formed for the reception of its ova. It continues to eat its way through the skin, and when its power of laying eggs is exhausted it dies. The whole duration of the life of an acarus is estimated by Gudden at three or four months. Impregnated females, placed on a healthy person's skin, were found by him alive, but exhausted, in the seventh or eighth week afterwards.

The "cuniculi," or passages formed by the female acarus ("sillons" of the French, "milbengänge" of Hebra and other German authors), are so important in the diagnosis of scabies, that a full description of them can hardly be otherwise than valuable to an English reader, for

we believe that in this country they are by no means so generally recognized as on the Continent. In the following account of them we follow chiefly that given by Hebra in the recent number of "*Virchow's Handbuch*." Their simplest form is that of a more or less curved, dotted line. Their color varies with their position, and with the station in life of the subject on whom they are found. On the hands and feet of the lower classes they are generally black; on the penis, buttock, elbow, and knee, even of such persons, they are usually white; and in people who wash very frequently, they are often white even upon the hands. The dotted appearance is caused, according to Gudden, by the air-holes which he asserts to exist in these passages. Hardy and Bazin state that it is produced by the small black faces of the acarus which are always found in the cuniculi. Hebra ascribes the dotted appearance to dirt, which, he remarks, penetrates the cuniculi so completely that it cannot be removed by washing or even by friction: so that, in people who are very dirty, the effect of ablu-tion is to make the cuniculi more distinct, by placing them in marked contrast with the rest of the skin. The length of a passage varies from one millimetre to several centimetres. The longest which Hebra has seen measured ten centimetres (nearly four inches); its usual length is about one and a half centimetre. Bazin compares it to a slight scratch caused by a pin; but the comparison does not appear to us a good one. The two extremities of the cuniculus are called by Hebra the "head" and the "tail," the former being the point at which the acarus entered. It is usually slightly raised above the surface of the skin, and whiter than the other extremity, at which the acarus may be observed as a sharply-defined roundish point, which is rather deeply situated.

This description of the cuniculus is generally applicable to those which are seated on the two surfaces of the hands and feet, or on the sides of the fingers and toes, or on the exterior surfaces of the limbs, especially the elbows and knees. On other parts of the body these appearances are generally modified by the development of a vesicle or a pustule beneath the cuniculus. These vesicles usually begin at the head of the passage, but frequently extend beneath it, so that it lies in their roof. Gudden supposes (and Bourguignon had previously suggested the same idea) that they are produced by a secretion from the acarus, which acts as tincture of cantharides might do; and he quotes in favor of this view the fact stated by Bourguignon and confirmed by himself, that the inoculation of a mass of bruised acari beneath the skin causes the development of a pustule resembling that of variola. However this may be, the acarus always maintains its position beyond the area of the vesicle; and therefore, when a crust is formed, the parent animal is never found in it, though it often contains ova or young acari. There is every reason to suppose that these crusts are often capable of pro-

pagating the disease, but experiments made with that object appear to have generally failed.

Sometimes the cuniculus presents a modification which it is important to recognize. It is then seated on a red elongated eminence, forming a white dotted line upon its summit. Cazenave seems to have noticed this appearance of the cuniculi which are found on the back and neck, and describes them as occupying the summit of tubercular elevations. Hebra states that such cuniculi occur also on the penis, the fold of the axilla, the umbilicus, the nipple, and especially on those parts of the back which are subject to pressure during sitting or lying. In infants the passages may present this form on any part of the body. Another modification is afforded by old cuniculi, when the vesicle at their head has disappeared, leaving a red spot with a white edge, which is continuous with the sides of the passage, so that Hebra compares its shape to that of a retort.

Cuniculi are undoubtedly found most abundantly on the hands and feet. Hebra, indeed, asserted at one time, that in 98 per cent. of cases of scabies they are confined to these parts. In 1844 he stated that the only other points at which he had found them were the penis and scrotum, the forearm (and that but seldom), the anterior surface of the thorax, and the knees. He now, however, admits that they may be detected elsewhere. Other observers do not agree with Hebra in the statement that they are very frequent on the feet. According to Lanquetin, in France they are rarely seen there; and Gudden says that in the lower limbs, the further from the trunk, the more rarely are they found. Hebra insists on the fact that in women the line of junction of the inner side of the foot with the dorsum is a favorite seat for them. It is well known that they are rarely to be detected upon the face. Lanquetin has, however, extracted the acarus from the forehead of a patient in the "service" of M. Cazenave. It is stated that Augias Turenne took one from within the lower eyelid from a "sillon" which occupied its free edge, in an infant. Dr. Hillier and others have also found cuniculi in rare instances on the face or forehead of infants; and of this, as we shall see, Gudden gives an explanation. The only other case, so far as we know, in which an acarus has been found lodged in a true mucous membrane, is that described by Hebra, who once found "a beautiful cuniculus, containing an acarus and eight ova, within the urethra, about a line from the meatus."

Eichstedt stated that the ova are not deposited in the egg-passages in a continuous series, but that there are always intervals after two or three, or at most six, ova. Gudden admits that this is the case in the cuniculi which are seated on the hands, where the acarus is exposed to frequent disturbance; but he says that on the trunk as many as twenty-one eggs are often found in an unbroken row.

Embryos are rapidly formed in these ova. In examining under the

microscope any cuniculus in which several eggs have been deposited, these are usually found to present different stages of development. There are, however, rarely more than from eight to fourteen which contain embryos; the others are merely egg-shells, from which the young acari have already escaped. Assuming that the parent animal lays one or two eggs daily, this gives some idea as to the rate at which they are hatched. There is, however, more direct evidence on this point, though it is not very satisfactory. If the ova are placed in watch-glasses and kept at a proper temperature, which is effected by fixing them in the axilla, they may be hatched artificially. Gudden says that four days was the shortest time within which the young acari have left the shell in his experiments. The statements of earlier observers are rendered valueless by the doubt whether the ova had been recently deposited when the process of incubation was commenced. It is, however, tolerably certain that the time is not always the same; for Gudden says that, after placing upon the skin acari which no doubt at once proceeded to deposit eggs, no empty shell was found within the cuniculus, in one case on the fifth, in another on the sixth day. It would be of great importance to ascertain how long the ova retain their vitality, when they are placed under unfavorable circumstances; but as to this point there is at present no evidence.

Having left the shell, the young acari almost immediately make their exit from the cuniculus also; and, according to Gudden, they avail themselves of the air-holes which he describes as existing in its roof. They then move over the surface of the skin with considerable rapidity, and, after a time, imbed themselves again within the cuticle. The passages which they form are usually very short; Gudden says he has seen some a line in length, but that these are rare exceptions. He states, however, that the young penetrate into the skin more deeply than the older acari, and that they therefore produce more irritation. Their bite is often followed by the appearance of a small papule or vesicle, in which exudation shows itself on the second day. Before this time the animal has usually moved off to another part of the skin. Hence the young acari are very difficult to find; but, according to Gudden, a diagnosis may sometimes be made, in slight cases of scabies, in which none of the larger cuniculi are to be detected, by cutting off the heads of some of the vesicles or papules, and examining them, without any varnish to render them transparent. The entrance of the passage formed by the young acarus may then be made out. When the light comes from below, the dried edge of the opening looks dark. Should there be any doubt as to its nature, the question may often be settled by the discovery of the feces, which are smaller and paler than those of the adult acarus. In order to obtain specimens of the young animal, the best plan is to rub oil of turpentine over a portion of the skin; this kills them, and they may then be found imbedded in the papules or vesicles which first appear on the part to which the oil of turpentine was applied.

The young acari have at first only six legs, but they soon shed their skin, and then acquire eight legs. The exact number of "moult" passed through by each acarum is perhaps not certainly known; Gudden supposes that the animal changes its skin three times. Before the first moult the acarum is characterized, according to him, not only by its six legs, but also by its having only two bristles at the posterior extremity of the body, and ten of the longer spines on its back. With its eight legs it acquires also four "bristles" and twelve "spines." After the second moult it presents fourteen "spines." After the third moult the sexual characters become apparent; and the male and female also differ in the number of spines, the female retaining fourteen, while the male has now only twelve. The size of the acarum also varies, according to the degree of its development. Gudden admits that it is possible that his account of the number of "spines" in the different stages may not be absolutely correct. While it is changing its skin the animal remains imbedded in small cavities in the skin, similar to those formed by the young acari. It would appear that about six or seven weeks are required for the development of the acarum, from the ovum to its becoming impregnated. Gudden says that in about three months after receiving a fertile female acarum upon the skin, a person would generally be covered with the eruption of scabies.

The discovery of the male acarum is claimed by several observers. The French ascribe it to Lanquetin, who found it in the year 1851, but who states himself that he had seen one before in the collection of M. Bourgogne, who had obtained it from an *employé* at St. Louis, but who did not know how to discover it. According to the Germans, the credit belongs either to Krämer or to Eichstedt. The former found it in 1845, but appears not to have published his drawings till 1846. Hebra quotes his description of the suckers on the inner pair of the hind legs, which are peculiar to the male; and therefore there can be no doubt that he really did see it. Lanquetin does not notice his claim, but disputes that of Eichstedt, who perhaps discovered it about the same time (1845), on the ground that the latter does not mention the presence of these suckers. It is therefore possible that the acari which he found may have been young females. The male acarum is very difficult to find. It occupies a small hole in the cuticle, similar to that tenanted by the young animals. According to Worms, it is very often to be found in the neighborhood of the larger egg-passages. It may be seen with a magnifying glass as a little brown point in the cuticle. Its presence appears never to excite any inflammatory action in the subjacent skin. Gerlach supposed that there was only one male acarum to about ten females, but the idea of the rarity of the male probably arose from the difficulty of finding it; for in the Norwegian scabies and among the cheese-mites males and females are stated by Gudden to occur in about equal numbers.

As might be expected, there is no very certain information as to the

way in which impregnation of the female acarus is effected. In a case of the Norwegian disease, Hebra found a male and female, both dead, lying the one over the other. There is, however, nothing to show that this was not accidental. Gudden states that there is not much difficulty in observing the act of copulation in the cheese-mites. The male and female then have their backs turned towards each other, and the abdomen of the male slightly envelopes the female. He says that the male becomes visibly smaller, and the female larger, during the process. In his later pamphlet he states that in the case of the acarus scabies, copulation occurs within the cuniculus occupied by the female after the last moult. He has several preparations in which he has been able to make out the points at which the male entered and left the passage. This he seems to have determined by the smaller size of the faeces deposited by the male. Gudden has also specimens of cuniculi in which the female underwent the process of moulting for the last time, and which have afterwards been continued onwards as egg-passages.

It is well known that the acarus is exceedingly sensitive to changes of temperature. Itch-insects, when first extracted from the cuniculus, often remain motionless; but if the glass slide on which they are laid is warmed, or if the warm breath is allowed to pass over them, they at once begin to move. Gudden states that, when they are placed upon the skin, the rapidity of their movements is always observed to depend upon the temperature of the surface at the time. Admitting the influence of warmth on the activity of the acari, it seems natural to ascribe to the movements of these animals the irritation which those who have scabies experience when the body first becomes warm in bed. Everybody knows that the itching is then worse than at other times; and Gudden says that a similar increase of irritation is felt whenever the skin is warmed, whether by the sun's heat, by exposure to a fire, or even by exercise; and, according to the same observer, cooling the surface quickly relieves the itching.

Some of the other peculiarities of scabies appear to receive their explanation on the same principle. If the acarus moves only on those parts of the skin which are warm, and therefore chiefly at night, it would seem to follow that parts which are uncovered during sleep will remain free from their presence. In this way Gudden accounts for the well-known fact that the face rarely presents any traces of the eruption in cases of scabies, and he states that this immunity is enjoyed by the face only when it is exposed at night; and, as we have already seen, several observers have found acari on the face or foreheads of infants, who lie with those parts deeply imbedded in pillows. An experiment made by Gudden points to the same conclusion. He placed a female acarus upon the left hand of a man who always slept on the left side, and with the clothes carefully pulled up round his chin. The young brood were traced up the arm on to the trunk; and one was caught on the left cheek, which

lay in the warm. The other side of the face remained free from their presence. The same writer says that cuniculi are rarely found on the feet of people whose feet are constantly cold. He also relates a very interesting case in which acari occurred in great numbers on the trunk, while none could be detected on the hands. This patient was confined in a strait-jacket, and her hands and feet were always cold, and did not become thoroughly warm even when she was in bed, as she was so unquiet that the bed-clothes could not be kept over her. The inner side of the arm, which was fixed to the side, presented a few cuniculi. This case is the more conclusive, as Gudden states that it was left undisturbed for a considerable time.

We are inclined to explain in a similar way a fact which seems to have been observed first by Hebra, and to which we have more than once heard him draw the attention of his class—that the disease is always present in large quantity on parts of the skin which are exposed to pressure. Thus in cobblers, tailors, weavers, and other artisans who sit on hard benches or stools, the buttocks, and especially those parts of them which come in contact with the seat, are always covered with the eruption. This consists in part of papules, in part of pustules and crusts; and some of these elevations of the skin present cuniculi on their long axes; others contain no parasite. On the other hand, in joiners, carpenters, and bricklayers, this part of the body is unaffected by the disease. Again, in women the eruption always shows itself on those parts of the skin which are pressed on by straps or girdles; and the pressure of garters, trusses, or of any tight article of apparel, or even of a crutch, is said by Hebra to be sufficient to produce the same effect. He accounts for these facts by ascribing the papules and pustules to direct irritation of the cutaneous surface; but it seems to us more reasonable to suppose that the pressure keeps up the warmth of the skin at that part, and that this favors the development of the acari, and at the same time prevents their wandering to other parts of the epidermis.

Hebra, however, does not admit that the distribution of the itch-insect over the skin is influenced to any great extent by temperature; but his reasons for this opinion do not appear to us to have any great weight. He says that if it were so, the eruption of scabies ought to increase rather than diminish during the progress of acute diseases, when the patient is kept constantly in bed; but there is every reason to believe that the morbid condition of the system has in this case a direct influence in checking the development of the parasite. Another of his arguments is, that if the acarus loved warmth, it ought to select the axilla, the bend of the elbow, and the softer parts of the skin, rather than the hands and feet, the penis, the buttock, and the extensor surfaces of the joints, on which parts the cuniculi are found most abundantly. But we have already seen that at the moment when the acari are moving over the surface of the skin, these parts are for the most part warm, and that the distribution of the acari is rather favor-

able to the view to which Hebra is opposed. Again, he gives as a reason for thinking that the acari are not much affected by external warmth, the fact that they reside in the deeper layers of the cuticle, which must be kept of a nearly constant temperature by the blood circulating through the derma; but this appears to us to remove a difficulty in the way of Gudden's view, by accounting for the fact that the ova can be developed in the cuniculi which are seated on the hand, and which must otherwise be exposed to considerable variations of temperature.

The truth is that, in Hebra's opinion, the acarus forms a very unimportant element in the causation of scabies, except so far as contagion is concerned. He criticizes the views of Gerlach and Aubé and others, who looked on the acarus as a kind of nocturnal beast of prey, which hunts for spoil at night on the surface of the skin, and retires during the day into the dark gallery which serves as its retreat. He says that it is not likely that the acari leave their stations of their own accord and without necessity, and take long journeys, in order to seek at another spot, and with considerable trouble, what they can get abundantly by staying where they are. Even in the propagation of the disease, Hebra regards them as altogether passive. He thinks that the cuniculi are torn open by the patient's finger-nails, and that in this way the ova and young acari are carried not only to the skin of other persons, but even to different parts of the same patient's body. Now, it is universally admitted that the female acarus never emerges from the cuniculus in which she lays her eggs; but it appears to us to be quite established, by the experiments of Gudden and others, that the young acari have the power of distributing themselves widely over the skin by their own movements; in fact, according to Gudden, they probably seldom remain more than three days in the same place.

Hebra makes the remark (and other dermatologists have said the same thing) that, viewed as a disease of the skin, scabies can scarcely claim an independent place in the scheme of classification, but that it should be regarded rather as an artificial eczema, caused by the presence of the acari and by the *scratching of the patient*. Now it is obvious that, if the acarus be the sluggish animal which Hebra supposes it to be, its presence in the skin is not likely to give rise to very much inflammation; and accordingly we find that of the two factors to which he ascribes the development of the eruption, the scratching on the part of the patient is the one to which he attaches most importance. It has long been known that the severity of the eruption is by no means proportionate to the number of acari which can be discovered, and that in the pustular scabies of children scarcely any cuniculi are sometimes to be found. Hebra also states that in no case does the seat of the acari and that of the eruption correspond; for while the former are found chiefly on the hands and feet, the penis, &c., the eruption is always more abundant on the anterior surface of the body, between the mammae above, and the

knees below. This he accounts for by supposing that the acari only produce a vague itching, not referred to any particular point, and that therefore the patient scratches himself at that part of the body which is most accessible to himself; that is to say, on the chest, abdomen and thighs. To us this explanation does not appear very satisfactory. With the exception of those papules or pustules on which cuniculi are seated, Hebra does not admit any part of the eruption of scabies to be caused directly by the irritation of the acari, but regards it all as the effect of scratching, with the exception of those appearances which, as we have seen, he ascribes to pressure.

There is, however, good evidence to show that papules and pustules may be produced in scabies, independently of scratching. Gudden says that his patient, who was confined in a straight jacket, presented tolerably large pustules, not only on other parts, but also on the shoulders, which were but little exposed to external irritation. Again, he placed a female acarus on the skin of a healthy man: she formed a cuniculus and deposited ova. Even during the first few days a kind of itching was felt over the whole body, which he rightly ascribes to excited attention; but on the ninth and tenth days a new sensation was felt, which was referred to the hand, and resembled a pricking or gnawing; and before long papules and vesicles made their appearance, and gradually increased in numbers. *Scratching was altogether refrained from*, and the eruption was caused solely by the bites of young acari. The point is not, perhaps, of much importance, for every one must admit that scratching does to a great extent aggravate the eruption in most cases of scabies; but it is, as we think, quite clear that the great German authority on cutaneous diseases is not altogether justified by the facts in his views upon this subject.

There can be no question that, since the appearance of the cuniculi has been thoroughly understood, the diagnosis of scabies has been immensely facilitated; it has, in fact, in a large number of cases, become a matter of demonstration. But we doubt whether these passages are generally recognized by medical men in this country. Only three or four years since, an eminent physician recommended searching for ova, rather than for the parent acarus, in doubtful cases. We have several times tried to find them, as he advised, by scraping the skin or examining the crusts; and, as might be expected, we have always been unsuccessful. But when one has once learned thoroughly the appearance of the cuniculi, the finding of the ova is often an affair of a few seconds only. We would strongly recommend to those who are learning medicine, the practice of slicing off with a sharp knife or pair of scissors any doubtful cuniculi, and examining them, *en masse*, under a low power of the microscope. In order to remove the parent acarus, it is necessary to cut rather deeply; but the detection of the ova or of the faeces may usually be effected without causing the slightest pain. The recognition of these cuniculi is of the more importance, because it appears that in some

cases they are the only manifestations of scabies. Baum and Eichstedt have especially drawn attention to this form of the disease, in which there is no trace of papules or of pustules; and Lanquetin describes a similar case, that of a young hysterical girl, who did not suffer from itching, and whose skin was quite healthy. This case might no doubt be cited in favor of Hebra's opinion, that the eruption is caused by scratching; but it is more probable that some morbid state of the cutaneous sensibility caused the absence of both the itching and the eruption.

We have already quoted the directions of Gudden for discovering the young acari or the short cuniculi in which they dwell. Gudden thinks that in almost every case of scabies, even though none of the longer passages can be found, it will be possible to detect those of the young animals; but it does not appear that he has under observation more than a small number of patients. In his earlier papers Hebra asserted that without the discovery of the cuniculi we are not justified in concluding that scabies is present. But the experience of 40,000 cases has caused him to change his opinion, and he now says that it is possible to make a diagnosis of the disease with great probability, if not certainty, in cases in which no cuniculi, nor even any of the papules caused by young acari, can be recognized. There can be no doubt that such cases do sometimes occur. Moreover, it must not be forgotten that the presence of cuniculi on the hands may be interfered with by many circumstances. In those who wash their hands very frequently, or who use pumice-stone to cleanse them, these passages are quickly destroyed; and, according to Hebra, they are also absent on the hands of washerwomen, hat-makers, and bricklayers, because these people employ in their business substances which are prejudicial to the acarus. In Paris an exaggerated importance is attached to the presence of a cuniculus on the skin of the penis, or on the glans, in the diagnosis of this disease; and according to Piogey, scabies is sometimes limited to that part only. We have heard Hardy insist on the fact, which we think he has also published, that eczema, confined to the female breast, is almost always caused by the presence of acari.

In No. LXVI. of this Review (April, 1864, p. 392), an account was given of the "rapid cure" introduced by Hardy at St. Louis. This method appears to be attended with very considerable success, and it undoubtedly presents the great advantage that it is carried out under the eye of the physician. Lanquetin states that it is doubtful whether all the cases are cured, as they are not kept under observation within the hospital. Great irritation of the skin is sometimes caused by this treatment, and therefore it is not adapted for private practice. Moreover, as Hebra remarks, the saving of time is more apparent than real, for the disappearance of the eruption must always take some days; and till that has occurred, the lay observer would not believe that a cure had really been effected. Al-

together, Hardy's plan of treatment seems best adapted for soldiers and the poorer class of laborers. We have often wondered why one of the large metropolitan hospitals does not establish a "skin department" on a large scale, in which these affections could be treated locally with baths, &c., on the premises, as is done in St. Louis and at Vienna.

In cases in which the eruption is generally diffused and severe, while cuniculi can be found only on certain parts of the skin, it might perhaps be advantageous to recommend inunction only at those points. Hebra states that he did this at one time with very fair success, but he then believed that the acari were rarely to be found except on the hands and feet; and when he gave up this opinion, he seems to have modified also his practice, so that his statements upon this point ought perhaps to be received with some caution, and as indicative of the sanguine nature of the man.

It seems to be generally thought in this country, that in order to prevent relapses it is necessary to disinfect the patient's clothing, in addition to inunction of the skin. Dr. Frazer, of Dublin, states that he has seen pustular scabies return more than once in a young child, till a pair of boots were destroyed to which the virus (according to his view) was persistently adhering. But though it cannot be denied that portions of loose epidermis, or crusts containing ova, may remain in the clothes, and so that a second contagion may arise, it does not appear that this is frequently the case. Gudden says that persons often sleep in their dirty beds, after treatment, without any relapse occurring. In the General Hospital at Vienna, where 1500 patients come under treatment every year, no attempt is made to disinfect the clothes, although there is every appliance requisite for doing so. The relapses are said never to exceed one per cent. It appears to be certain that living acari never wander of their own accord into articles of clothing, as pediculi often do.—*British and Foreign Medico-Chirurgical Review.*

THE BOSTON MEDICAL AND SURGICAL JOURNAL.

BOSTON: THURSDAY, AUGUST 24, 1865.

THE RELATIONS OF VARIOLA TO VACCINIA. ANIMAL VACCINATION.—If there is any one point in the pathology of variola and vaccinia which we have considered established beyond a question, it is the opinion that vaccinia is modified variola. That both are identical in nature, the former being the product of the latter acting upon the cow or horse, but modified by the constitution of these animals to such a degree that its introduction into the human system from such a source is entirely innocuous, while it establishes a disease so nearly allied to variola as to exclude that disease, in most cases, from any future occupation of the constitution thus occupied. It would seem, however,

that the French Academy of Medicine are not satisfied with the results obtained by experimenters heretofore, and having examined the subject *de novo*, they have come to conclusions directly opposite to those usually claimed to result from similar experiments. It is true that in rare instances the inoculation of the cow with smallpox virus, and the subsequent inoculation of the human subject with virus from the produced pustule, has led to the development of smallpox instead of the expected vaccine disease. If the results of the Academy's experiments are to be depended upon, however, the method which has been thought to furnish the readiest means of obtaining a supply of vaccine matter in an emergency, at a distance from any source of supply, namely, that of inoculating the cow with smallpox matter, and taking from the produced pustules matter for purposes of vaccination, is entirely unreliable. It is hard to explain the incongruity of the results contained in the report to the Academy and those published in medical works of acknowledged authority. It is possible that some unappreciated influence of season or diathesis interfered with the ordinary action of the smallpox virus experimented with. Certain it is that this question cannot be suffered to remain involved in any new obscurity—thrown about it by so authoritative a body as the French Academy. We hope to see before long confutation or confirmation from some other source, together with some reasonable theory to account for the impressions which have at the present time so firm a hold on professional opinion. We find the results referred to reported in the *Archives Générales de Médecine* for July. It is there stated that at the session of the French Academy of Medicine held May 30th, M. Chauveau communicated the principal results of his experimental researches on this important subject.

These experiments, undertaken at first in consequence of a discussion in the Academy on this question, by a commission of which he was a member, with Messrs. Viennois and Meynet, are recorded in a report read to the Society of Medical Sciences of Lyons. It was an analysis of this report that M. Chauveau presented to the Academy.

The Commission has studied principally in the two principal vaccine-bearing and vaccine-generating animals—the ox and the horse—the effects of vaccine and variolous inoculation.

M. Chauveau sums up in these terms the results and conclusions of these experiments :—

1. Human variola is inoculated on the cow and horse with the same certainty as vaccinia.

2. The effects produced by inoculation of the two diseases are entirely unlike.

In the cow, variola produces merely an eruption of papules, so small that they would escape observation, if attention had not been called to their existence. Vaccinia, on the contrary, produces a vaccine eruption, the typical form of which is large and well-characterized pustules. In the horse there is also a papular eruption, without secretion or crusts, produced by variola; but, although this may be much more severe than that of the cow, it could never be confounded with the horse-pox, so remarkable for the abundance of the secretion and the thickness of the crusts.

3. Vaccinia inoculated singly upon animals of the bovine and equine species, protects them generally from variola.

4. Variola inoculated upon these same animals generally prevents a subsequent development of vaccinia.

5. Cultivated methodically upon these same animals, that is to say, transmitted from cow to cow, or from horse to horse, variola does not approach in characters to the vaccine eruption.

At the same meeting of the Academy, Dr. Lanoix read a paper on Animal Vaccination, containing the results of his experiments since his first communication, in October last. The following are the principal results announced :—

In a first suite of re-vaccinations, done at the Lyceum of the Prince Imperiale, 180 children from 9 to 12½ years of age were re-vaccinated ; and of this number there were 63 in whom the vaccination produced good vaccine pustules.

In a second suite, 200 younger children, from 7 to 9 years of age, were vaccinated. In 20 only of them was a good vaccinia produced. In all there were 80 successful vaccinations out of the 380 re-vaccinated ; that is to say, 20 to the 100.

Two months after, Dr. Michel, Physician to the Institution of Fontenay, re-vaccinated all the children of that College with animal vaccine. Out of 400 children 76 had a good vaccine disease. Adding to the above figures 40 other re-vaccinations practised on children from 7 to 13 years of age, we have a total of 820 re-vaccinations, of which 159 were successful, or 21 to the 100.

M. Lanoix also reports the results obtained by M. Dhéré in a young girls' boarding-school, and published in the *Gazette des Hôpitaux*, March 2d, 1865.

Re-vaccination in subjects from 14 to 20 years old, to the number of 71, gave 31 cases of success. In adults from 20 to 40, the number of cases of successful vaccinations was 97 to 200. There were 7 in 30 subjects, from 40 to 50 years old. Finally, of 5 persons from 50 to 60 years old, 2 were successfully re-vaccinated.

Finally, the author expresses his confidence in the results obtained by M. Negri. "As I was six months ago," he says, "and even more convinced now, I come to tell you that the transmission of vaccinia from heifer to heifer is always possible, and with such ease as to supply the needs of a large practice. That the vaccine does not grow weak, but that its activity is longer preserved, with more certainty, in its passage through the animal organism than through the human. That such vaccinations give always or almost always a positive result ; re-vaccinations an average of success superior to the average of success produced by human vaccine lymph. That vaccination with virus from the heifer is easy. That it becomes in a time of an epidemic of variola a powerful resource to combat that terrible disease, by reason of the abundance of vaccine matter which may be rapidly conveyed to all points where it may be required."

We should be glad to learn from any of our friends in this vicinity, who have been using virus from the cow, whether these deductions correspond with the results of their experience.

110 SOUTH MAIN ST., PROVIDENCE, 8th mo. 21, 1865.

MESSRS. EDITORS,—I notice in your JOURNAL of the 17th inst., a synopsis of a case of "*Ovarian Tumor*," p. 62, reported by me at a

meeting of our City Association. The case was verbally and hastily reported, a few hours after making the *post-mortem* examination, and the Secretary consequently fell into some errors, which I would have corrected had I known it was to have been published. With your permission I should like now to correct one or two. The whole of the left leg was swollen and œdematous, from obstruction of the femoral vein. Dr. Burnham, of Lowell, in passing through the city, at my request, kindly visited the patient with me but a few days before she died. He thought an operation for the removal of the tumor might be undertaken with some prospect of success, but it was not attempted. The operation performed on the third (3d) of June was simply tapping the abdomen to relieve distress from distension. She sank and died the following day. The tumor was removed after death, and found to weigh about seven pounds. There were two small cysts upon the anterior surface, but the great portion of the mass was solid, and presented rather strongly the appearances of a malignant growth. From the extensive adhesions found, it is not probable that it could have been safely removed, even at a much earlier stage of its development.

Very respectfully yours, G. L. COLLINS.

AN INCH OF RAIN.—The last weekly return of the Registrar-General gives the following interesting information in respect to rain-fall :—"Rain fell in London to the amount of 0.43 inch, which is equivalent to 43 tons of rain per acre. The rain-fall during the last week varied from 30 tons per acre in Edinburgh to 215 tons per acre in Glasgow. An English acre consists of 6,272,640 square inches; and an inch deep of rain on an acre yields 6,272,640 cubic inches of water, which at 277-274 cubic inches to the gallon makes 22,622.5 gallons; and, as a gallon of distilled water weighs 10 lbs., the rain-fall on an acre is 226,225 lbs. avoirdupois; but 2240 lbs. are a ton, and consequently an inch deep of rain weighs 106-993 tons, or nearly 101 tons per acre. For 100th of an inch a ton of water falls per acre." If any agriculturalist were to try the experiment of distributing artificially that which nature so bountifully supplies, he would soon feel inclined to "rest and be thankful."—*Am. Jour. of Pharmacy*, from *Journal of Society of Arts*.

TEMPERANCE.—At a Temperance Convention recently held at Saratoga Springs, Drs. A. B. Palmer, N. S. Davis, and Worthington Hooker, were appointed a committee for the objects set forth in the following resolutions. We commend the subject to the attention of our readers. Anything that our profession can do toward staying the tide of drunkenness, the bane of our land, and opposed to the spirit of our free institutions, should be done with zeal and earnestness.

Resolved, That in view of the recent developments of scientific investigation in Europe and in this country, the published opinions of medical men on both continents, and especially in view of the evil effects which are often known to follow the use of alcoholic medicines, this Convention respectfully but earnestly request all engaged in this honored and influential profession to substitute other articles in the place of alcohol, so far as in their judgment it can be wisely done.

Resolved, That Profs. A. B. Palmer, N. S. Davis, and Worthington

Hooker, be a committee to convey our request to the men of their profession, and use such other means as they may deem wise and best to secure the operation of all medical men in the great cause we seek to advance.—*Med. and Surg. Reporter.*

NEW HAMPSHIRE ASYLUM FOR THE INSANE.—On the 1st of May, 1864, there were in the Asylum 217 patients—103 males, and 114 females. Since that day to the 1st of May, 1865, there have been admitted 107—59 males and 48 females, making, in all who have been under care during the year, 324—162 of each sex. The daily average residence for the whole year has been 218.4. The largest number of patients at any one time has been 226, and the smallest number 208. The average residence has been 11 above that of the preceding year, and 25 above that of the second year preceding. The number of removals during the year has been 102; of these 22—17 males and 5 females—have died; and 79—42 males and 37 females—have been discharged, leaving in the Asylum on the 1st of May, 1865, 223, of whom 103 are males, and 120 are females. Of the deaths, 17 were over 50 years of age, 10 were over 60, 7 over 70, 3 above 80, and 1, 90.

SURGEON GENERAL BARNES, whose rank defined by law is that of Brigadier General, has had the brevet of Major General conferred on him by the President for distinguished services.

DR. GEORGE DERBY, Surgeon U. S. V., now in charge of Cony Military Hospital, Augusta, Me., has been promoted by the President, through the Secretary of War, to the rank of Lieutenant-Colonel by Brevet.

ASSISTANT SURGEON J. T. CALHOUN, U. S. A., Commanding Ward General Hospital at Newark, N. J., has been breveted to a Major in the Regular Army, to date March 13th, 1865, for "faithful and meritorious services during the war."

VITAL STATISTICS OF BOSTON.
FOR THE WEEK ENDING SATURDAY, AUGUST 19TH, 1865.
DEATHS.

	Males.	Females.	Total.
Deaths during the week	45	49	94
Ave. mortality of corresponding weeks for ten years, 1853—1863,	52.7	52.2	104.9
Average corrected to increased population	00	00	116.03
Death of persons above 90	0	0	0

COMMUNICATIONS RECEIVED.—How to extinguish a fire on board a Ship at Sea or in Port.—Nitrous Oxide Gas—Is it safe for Inhaling.—Case of Melanosis.—Removal of Cataract of long standing from an aged person.

PAMPHLETS RECEIVED.—Records of the Twelfth and Thirteenth Annual Meetings of the Maine Medical Association, convened in Portland June 15, 1864, and June 20, 1865.

DEATHS IN BOSTON for the week ending Saturday noon, August 19th, 94. Males, 45—Females 49. Anemia, 1—apoplexy, 1—congestion of the brain, 2—disease of the brain, 2—burns, 2—cancer, 1—cholera infantum, 19—cholera morbus, 5—consumption, 12—diarrhoea, 7—dropsy, 2—dropsy of the brain, 2—drowned, 2—dysentery, 9—typhoid fever, 2—disease of the heart, 2—infantile disease, 3—inflammation of the lungs, 4—marasmus, 2—peritonitis, 1—premature birth, 1—scrofula, 2—disease of the spine, 1—teething, 2—unknown, 6—whooping cough, 1.

Under 5 years of age, 45—between 5 and 20 years, 12—between 20 and 40 years, 14—between 40 and 60 years, 14—above 60 years, 9. Born in the United States, 68—Ireland, 24—other places, 2.